

NOTES AND DESCRIPTIONS OF HYMENOPTERA FROM THE WESTERN UNITED STATES.

In the collection of the University of Kansas.*

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II.

BOREAL SPECIES.

EUMENIDÆ.

Eumenes (Alpha) marginilineatus n. sp.

♂.—11 mm. Wings brownish, transparent. Otherwise it has the group characteristics of *fraternus* as tabulated in Sausure's American Wasps.

Sculpture and pubescence pretty much the same as in *fraternus*. Thorax a little longer than wide.

Black; clypeus, labrum and tibiæ entirely yellow, a somewhat funnel-shaped mark on the face extending from a trifle above the insertion of the antennæ, the scape in front with a broad stripe, an oblong or nearly oblong mark on head above immediately back of each eye, the anterior margin of the pronotum, a transverse band on the postscutellum, and an apical marginal band on each of the abdominal segments, excepting the apical ones and the first ventral, yellow; tips of mandibles and hooks of antennæ brownish-ferruginous, tegulæ partly testaceous, stigma and nervures dark brown. The yellow band at apex of second dorsal segment, deeply angularly emarginate, a yellow spot on each side of the same segment.

Type.—University of Kansas.

Type locality.—Este's Park, Larimer Co., Colorado.

One specimen, taken in July, 1892, by F. H. Snow (U. of K. collection, lot 153).

CRABRONIDÆ.

Crabro (Anothyreus) viciniformis n. sp.

Related to *vicinus*. Metanotum with no strong sulcus, the bands on the dorsum of the abdomen not interrupted.

♀.—9 mm. *Head*.—Dullish, finely sculptured, seemingly impunctate in front, shining, indistinctly punctured behind; anterior margin of clypeus almost straight, not dentate laterally.

Thorax.—Pronotum convex, with hardly any inequalities in its surface; mesonotum sculptured pretty much the same as the posterior aspect of the head; mesopleura with sparser, smaller, distinct punctures compare with the mesonotum; metanotum indistinctly radiately strigate, with its longitudinal median sulcus broad and shallow; the posterior face of the metathorax and its pleura

* Continued from Trans. Amer. Ent. Soc., 1906.

indistinctly roughened and shining, the former with the sulcus of the metanotum prolonged down its middle.

Abdomen.—Shining below, mostly subtle above.

Color.—Mostly black, scape and pronotum entirely yellow, otherwise as in *vicinus* as described by Fox, Crabroninae of Boreal America.

Type.—University of Kansas.

Type locality.—Base of Humphrey's Peak, 9500 feet, Coconino Co., Arizona.

One specimen, taken in August by F. H. Snow.

ARID TRANSITION SPECIES.

BRACONIDÆ.

Doryetomorpha shoshonea n. sp.

♀.—5 mm. *Head*.—About as long as wide, almost completely dullish and finely, closely, transversely striate; between the insertion of the antennæ and the base of the clypeus there is a somewhat oval, median, longitudinal polished space; the cheeks are partly polished, partly longitudinally striate with striae similar to those on the face and vertex, occipital region polished; in addition, the head is mostly black, the upper half of the eye being engaged by a brownish testaceous mark on the tegment of the cheeks, vertex and face, the lower fourth of the face brownish to yellowish-testaceous, mandibles brown, tipped with blackish; scape yellowish-testaceous about twice the length of the pedicel which is concolorous with the scape, together these joints are hardly as long as the first joint of the flagel, which last is in turn distinctly longer than the succeeding joint, but decidedly shorter than the next two joints combined, flagel more than 18-jointed, brownish-testaceous, to brownish; joints of the palpi subequal in length, filiform and whitish.

Thorax.—Mostly dullish, black, partly castaneous beneath; pronotum brownish, shining, seemingly sculptureless, almost covered by the forward arching of the mesonotum, which last is divided into three parts by the parapsidal grooves, which are deep and partly somewhat foveate and extend from the anterior to the posterior margin of the segment, the lateral parts of the mesonotum are equal in size and somewhat triangular and granular, the middle part is trapezoidal, occupying nearly all of the anterior edge and the middle third of the posterior edge of the mesonotum, granular on its anterior half and reticulate on its posterior half, the reticulate portion being traversed longitudinally by three rather irregular and equidistant ridges or strongly raised lines; propleura granular, brownish and broadly margined with foveæ on a black surface, the extreme lower margin of this sclerite is somewhat granular and striate; prosternum foveate and brown immediately before the anterior coxæ, anteriorly to the latter area pale yellowish-brown, transversely striate in part and longitudinally impressed; mesopleura granular, with a broad oblique foveate impression extending from the anterior-inferior angle to near the posterior-superior angle of the segment, the latter segment mostly separated from the mesosternum by a deep foveolate furrow; mesosternum mostly shining, inconspicuously granular and bisected by a longitudinal foveate impression; metanotum with most of its space occupied by a rather imperfectly formed diamond-shaped reticulate area extending from base to apex

and between the lateral areas, which latter are more moderately reticulate and twice as broad on the apical half of the metanotum as on the basal half thereof, the areas between the central area and the lateral areas are rather triangular and granular; metapleura reticulate; metathorax dorsally convex; legs pale yellowish-testaceous, tarsi inclining to brownish; wings transparent, tinted with brownish, most of the nervures and the stigma brown; first and second transverse cubiti mostly weak and colorless, costal nervure between the stigma and base of wing yellowish-brown.

Abdomen.—Mostly black, the first two dorsal segments partly castaneous; first dorsal segment wider at apex than at base, which last is about two-thirds half the length of the segment, which is dullish and longitudinally striate, except for a median area, which holds pretty much the same relation to the segment as the median area of the mesonotum bears to that sclerite, but on its basal half it is mostly bounded on each side by a raised line and rather transversely foveate, while on its apical half it is mostly longitudinally striate like the adjoining surface; the second dorsal segment mostly dullish and more finely longitudinally striate than the first segment, but medially the striae are ill defined and wider apart, with polished surface between them; the third dorsal segment is longitudinally striate only at base, mostly smooth and shining like the rest of the dorsal segments; ovipositor and sheaths dark brown, tipped with blackish and approximately 3.5 mm. long.

Type.—University of Kansas.

Type locality.—Near Lauder, Wyoming.

One specimen.

***Doryctes apacheus* n. sp.**

♂.—7.5 mm. *Head*.—Black and polished, except for the face below the antennae which has widely separated punctures and is longitudinally divided by an impunctate space which is not as wide as the flagel and which is prolonged above as an impressed line, and the cheeks which have a few scattered punctures, frons transversely impressed with a deeper longitudinal median impression; antennae black, the scape nearly three times the length of the pedicel but nearly as long as the first joint of the flagel, the latter more than 17-jointed, its joints subequal.

Thorax.—Mostly shining black; pronotum indistinctly sculptured, with a median transverse constriction, the posterior portion being humped; propleura partly polished, punctate, partly rugulose; prosternum polished, sparsely but distinctly punctured, parted anteriorly and posteriorly by a deep impression, the anterior of which is deepest and divided longitudinally by an elevated fold formed apparently by the union of the two sides of the segment, immediately adjoining this fold on each side is a narrow rugose space; mesonotum subtrilobate, the median lobe a little larger than the lateral ones and more strongly convex, slightly longitudinally impressed along the middle of the anterior half and polished with scattered few punctures, the posterior half rugulose, the lateral lobes more uniformly polished and with a few scattered punctures; scutel separated from the mesonotum by an almost smooth, shining transverse band, the scutel proper somewhat arched, indistinctly punctured and sculptured, rather

dullish; mesopleura mostly without sculpture and polished, separated from the sculptureless bisected mesosternum by a deep furrow; mesosternum yellowish-testaceous as is the lower edge of the mesopleura; metathorax ferruginous above, its pleura brown and crudely sculptured and punctured, the metanotum rugulose with a median ill-defined somewhat diamond-shaped area, less than one-third as wide as the metanotum and open behind, wings infuscated or smoky, the nervures and stigma blackish; anterior and middle coxæ and trochanters blackish, the posterior ones reddish.

Abdomen.—Mostly dull orange color, the sutures mostly citron-yellow, dorsal aspect of first dorsal segment about one and one-half times as long as wide at apex, longitudinally striate and separated from the sides by strong carinæ, one on each side; the second dorsal segment nearly three times as wide as long, partly yellow and with a semi-circular radiately striate area on its basal half, the remaining portion of the segment smooth and shining as are the remaining segments.

Type.—University of Kansas.

Type locality.—Fort Apache, Navajo Co., Arizona.

One specimen, taken between August 8-26, 1897, by F. H. Snow.

***Doryctes femur-rubrum* n. sp.**

♀.—8.5 mm.; ovipositor 4.5 mm.—Very like *apacheus* from the description of which it differs as follows:

Head.—Essentially as in *apacheus*, antennæ 56-jointed.

Thorax.—Scutellum proper separated from the mesonotum by an oblong excavation that is longitudinally divided by a ridge and foveate, the scutellum proper shining or polished and sparsely finely punctured; mesosternum and mesopleura posterior to the oblique rugulose impression as well as the metathorax, middle coxæ, posterior coxæ and trochanters, and all but the black tips of the posterior femora more or less ferruginous, metanotum rather distinctly areolate with spiracular, middle pleural, external and external median areas differentiated, the greatest width of the areola about as great as one-third the width of the metanotum.

Abdomen.—Ferruginous, all but dorsal segments 1 and 2 polished, the former rugopunctate, the latter mostly radiately striate, rugose at extreme base.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff in Coconino Co., 5000 ft., Arizona.

One specimen, taken in August by F. H. Snow.

***Iphiaulax triangulifera* n. sp.**

Third, fourth and fifth dorsal abdominal segments rugose. ♀.—6.5 mm. *Head*.—Black, antennæ blackish-brown; mostly as in *militaris*, but the scape shining, nearly twice as thick as the flagellum in the middle, its margins produced, sub laminate, pedicel about one-third as long as the scape, about two-thirds the length of the first joint of the flagel, flagel over 44-jointed, its joints subequal.

Thorax.—Smooth and polished, seemingly sculptureless, pro- and mesopleura

each with an oblique channel, the latter seemingly separated from the former by another oblique channel; a longitudinal channel separating the metanotum from the metapleura; parapsidal grooves almost wanting, indicated only by the merest impression of the tegument; ferruginous, the legs and a stain on each side of the mesonotum black; wings transparent, but strongly brown, the nervures and stigma a darker brown than the membrane.

Abdomen.—Ferruginous, tipped with blackish, shining; first and second dorsal segments more or less reticulated and as in *militaris*, the triangular area of the second segment, however, with its apex attaining the apical margin of the segment; ovipositor 5 mm. long, of the same color as the flagel.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 6000 ft., Oak Creek Canon, 20 miles southwest of Flagstaff, in Coconino, Arizona.

One specimen taken in August by F. H. Snow.

ICHNEUMONIDÆ.

Syndipnus erythrogaster n. sp.

♂.—9 mm. *Head*.—Shining, minutely indistinctly punctured, covered with short, silvery, inconspicuous pubescence; the face below the antennæ almost entirely yellow, the yellow extending up on the front along the eye margin, the rest of the front black, a brown arcuate band extending from eye to eye and skirting the posterior ocelli, back of which the vertex and upper part of cheeks are black like the occiput; cheeks mostly pale brown; malar space yellow; mandibles yellow, tipped with brown; scape, pedicel and first joint of flagel more or less yellow beneath, blackish-brown above, the second, third and fourth joints of the flagel brownish or blackish-yellow beneath, blackish above, the first flagellar joint about as long as the combined length of the next two, the scape somewhat oviform, nearly twice as thick as the pedicel and nearly three times as long as the latter; clypeus not separated from face, about as wide as the eye, truncate; upper half of face below antennæ with a median longitudinal slight eminence; palpi whitish.

Thorax.—In sculpture and pubescence about the same as the head; dorsulum practically not at all impressed, and brown, excepting its edge laterally and posteriorly; pronotum inconspicuous, black, its pleura roughened, black and brown, with the tubercle yellow; scutellum mostly brown; other parts black, with or without brown stains; metathorax with only the median longitudinal and apical transverse carinæ on the dorsal and posterior aspects, but these are strongly developed, the former forming a nearly oblong area and the latter an almost crescentic area, which latter is longitudinally bisected by a carina; coxæ and trochanters of middle legs and trochanters of posterior legs almost entirely yellow, the remainder of the anterior and middle legs, excepting tips of terminal tarsal joint, claws and pulvilli which are brown, pale testaceous, posterior coxæ black, with yellowish tip, posterior femora blackish and brown, basal two-thirds of posterior tibiæ pale brown, the apical third blackish, the first, second, third and fourth joints of the posterior tarsi yellow to yellowish, with a brownish tint, the apical joint brown, but a paler shade than the claws and onychiæ; wings transparent, tinted with brown, nervures and stigma mostly dark brown, tegulæ

yellow, second abscissa of the cubital nervure not much more than half the length of the transverse cubitus.

Abdomen.—Mostly smooth and polished, the first dorsal joint nearly three times as long as wide at apex; the second dorsal segment longer than wide at base and about as long as or a little shorter than wide at apex, the succeeding joints wider than long and rather oblong in outline; ferruginous, tipped with blackish.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 690 ft. elevation, 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

One specimen captured by F. H. Snow in August.

Mutilla (Dasymutilla) apachea n. sp.

♂.—6 mm. *Head*.—Distance between posterior ocelli a little less than that between them and nearest eye margin; face rugopunctate, the rest of the head coarsely punctured and nearly as closely punctured as possible, frons with a median longitudinal impression extending downward from the anterior ocellus; entirely black or blackish, with the exception of the eyes, which are rather steel color.

Thorax.—Excepting the metathorax, which is coarsely reticulate, punctured much like the head, same color as the head; beyond the radial, second submarginal and first and second discoidal cells the venation is faint, shadowlike, wings strongly brown, with a large portion of the basal two-thirds paler than the rest of the wing, stigma and nervures blackish-brown.

Abdomen.—First ventral segment with a blunt obtuse angled median longitudinal keel; the second ventral segment not at all felted, the second dorsal with a felted line parallel to the lateral margin and removed therefrom to about the width of the apical joint of the flagellum, extending the length of the middle two-fourths of the segment; first segment black, sculptured very like the head; the succeeding segments pale brown, not so coarsely punctured as the first; pygidium finely and coarsely roughened, rather oblong and distinctly margined.

Type.—University of Kansas.

Type locality.—Fort Apache, Navajo Co., Arizona. One specimen. August 20, 1897.

EUMENIDÆ.

Eumenes (Alpha) globulosiformis n. sp.

Related to *globulosus*, from which it differs as follows.

♀.—*Head*.—Clypeus rather coarsely striato-punctate, its anterior margin forming an inverted M, with the emargination rightangular; yellow of face confined to a transverse basal bar on the base of the clypeus and another transverse bar between the sockets of the antennæ; the basal lobe on the inner edge of the mandibles about three times as long as high, the apical lobe, *i. e.*, the one before apex of the mandible nearly as high as long.

Thorax.—Convexities of the metathorax strong, the channel separating them rather deep throughout; tegulæ almost completely reddish-brown.

Abdomen.—Apical margin of first and second dorsal segments distinctly swollen, that of the second, the anterior aspect of the swollen portion of the second segment, in the middle, when viewed from the side forming an obtuse angle with the remainder of the segment; punctuation of the first dorsal segment sparse, excepting medially and along the margins; the second dorsal segment conspicuously dullish; apical segment immaculate; venter dullish.

Remarks.—The pubescence is superficially inconspicuous, but on close inspection seen to be fine, abundant, tinted with ochreous and mostly less than 1 mm. in length.

♂.—Excepting the sexual peculiarities essentially like the ♀, clypeus yellow, excepting laterally, and a transverse testaceous mark close to the apex of the emargination; hook of antennæ brown; tibiæ and tarsi entirely dull ferruginous and brown.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

Two specimens taken in August by F. H. Snow.

***Eumenes (Pachymenes) bolliiformis* n. sp.**

Related to *bolli*, from which it differs as follows:

♀.—*Head*.—With the following exceptions almost exclusively black: clypeus, excepting an almost central blackish dot and a subapical testaceous mark yellow, an hourglass-shaped supraclypeal mark, scape in front, labrum, and a short post-ocular line more or less yellowish; clypeus distinctly but not much longer than wide, its anterior margin forming a segment of a circle; greater part of apical third and outer margin of mandibles brown, the teeth about as in *globulosiformis*.

Thorax.—Black, with the exception of the following parts, which are more or less yellow to yellowish-ferruginous: pronotum in the middle and its anterior and posterior margins, tegulæ, a spot on pleura beneath tegulæ, a spot on each side of scutell, postscutell, the greater portion of the superior aspect of the metathorax and all of the legs excepting the coxæ and trochanters; wings nearly as in *globulosus*.

Abdomen.—Dullish; first segment black, except for an apical yellow margin and a yellowish ferruginous spot on each side; the second segment with the basal half mostly black, the apical half mostly yellow, the black portion on the second dorsal segment somewhat hourglass shaped; the normally exposed portion of each of the succeeding segments practically entirely yellow.



E. bolliiformis.
Natural size.

♂.—Smaller; clypeus rather indistinctly punctured with punctures of two sizes, the large ones rather sparse, no central blackish spot, otherwise nearly as in the ♀; hook of antennæ brown; apical ventral abdominal segment immaculate, apical third of second abdominal segment mostly yellow; a free, nearly oblong yellow mark on each side of the middle third of the second dorsal abdominal segment, the apical yellow band of this last segment triangularly emarginate on its anterior margin.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

Collected in August by F. H. Snow.


Two ♀ and three ♂ paratopotypes exhibit the following atypical modifications: ♀, no blackish spot on clypeus; ♂, scutel entirely black; lateral marks of second dorsal abdominal segment not free, the yellow margin of the same segment not emarginate on its anterior edge.

In all the specimens of this species examined, there is a persistent subapical, median rounded or transverse mark on the yellow portion of the second dorsal abdominal segment.

Eumenes (Alpha) cruciferorum n. sp. (Pl. XII).

Related to *emarginilineatus*.

♀. *Head*.—As in the related species, with the exception of the clypeus which is about as long as wide, with its anterior edge triangularly emarginate, the angle of the emargination being a little greater than a right angle, shining and rather coarsely but not deeply, sparsely punctured, with the middle mark united to a rather circular black mark with a short petiole of black, the rest yellow; labrum brown.

Thorax.—This portion of the insect and its appendages are essentially as in *emarginilineatus*, barring the following points: yellow as follows—a short line on each side of the mesonotum adjoining the posterior edge of the pronotum, a small spot on each side of the scutellum, a spot on the pleura beneath the tegulæ, two spots on each tagula and a -shaped mark on the anterior and lateral edge of the metanotum, *i. e.* the posterior aspect of the metathorax; the anterior femora are mostly yellow beneath.

Abdomen.—Much as in the related species, the petiole more elongate, three or nearly three times as long as wide at apex, shining, rather deeply and sparsely punctured and with a yellow dot on each side a little beyond the middle; first dorsal segment shining, its punctures about the same as those on dorsum of petiole but closer together, its lateral spots amplified to form an interrupted band which unites with the apical band laterally, giving the black portion of the segment a sort of hour-glass appearance; apical band nonemarginate, a little more than half of the second ventral segment yellow.

♂.—Essentially like the female; clypeus longer than wide, indistinctly punctured, entirely yellow; labrum tipped with yellow; hook of antennæ brown; dorsulum, scutel and metathorax immaculate; apical band of second dorsal segment emarginate, its yellow lateral spots separate, free and elongated into cuneiform marks; second ventral segment with less than half of its surface yellow, the succeeding segments excepting the apical one banded or spotted with yellow; anterior femora only tipped with yellow.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Captured in August by F. H. Snow.

Eumenes (Alpha) enigmatus n. sp. (Pl. XII).

♂.—Differs from *emarginilineatus* as follows: tegulæ partly, a spot beneath latter on pleura, a short band on each side of metathorax, an elongate cuneiform mark on each side of the second dorsal abdominal segment, a cone-shaped mark on first ventral segment, a large helmit-like mark on second ventral segment and a yellow apical line on each of the following segments, except the apical one, yellow. In addition, the convexities of the metathorax are rather hemispherical and the petiole is broader.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Two paratopotypes, one of which has a yellow spot or dot on each side of petiole.

All taken in July and August by F. H. Snow.

Odynerus sulfuritinctus n. sp.

Related to *scutellaris*, from which it can be readily separated by the excavated metathorax, etc.

♀.—13 mm.—*Head*.—Front distinctly punctured, the punctures adjoining and placed in a shining tegument; clypeus and cheeks more shining and with their punctures more separated than the dorsum of the thorax; covered with pubescence varying in color from brownish-gold to yellowish-gold, but nowhere obscuring the tegument; black and yellow, the yellow confined as follows, a line on basal half of mandibles, clypeus excepting the margins of the anterior half and a triangular space in the middle, a spot between the insertion of the antennæ, the anterior aspect of the scape and an ovoid mark back of each eye; vertex with a deep pit posterior to the hind ocellus, giving the appearance of there being an additional simple eye.

Thorax.—Black and yellow, pubescent in much the same way as the head, its pubescence of the same kind; pronotum bordered with yellow along its anterior margin; anterior femora and tibiæ partly yellow, the anterior tarsi almost completely yellow; mesothorax above sculptured much the same as the front and most of the remainder of the thoracic dorsum, its pleura more shining on account of the punctures being more separated; its yellow portions are as follows: a spot immediately posterior to the tubercles on the mesopleura, all excepting the central testaceous portion of the tegulæ, the post scutel, middle and posterior coxæ anteriorly, middle and posterior femora in part, greater portion of its tibiæ and the middle tarsi almost entirely, the posterior tarsi brownish like the hindmost portion of the adjoining tibiæ, wings brownish, with a yellowish reflection, posterior edge of postscutel with a series of short broad rather indistinct teeth;

metathorax shining and transversely striate, presenting a concave surface bisected by a narrow shining smooth space part way down the middle and partly by a somewhat incomplete longitudinal channel, its lateral margins terminating in the middle in a rather acute angled tooth, a yellow mark on each side of its dorsal aspect.

Abdomen.—With its pubescence and color much the same as on the thorax, rather closely punctured, the punctures closer and coarser near the edges of the 2nd-5th segments than elsewhere; first dorsal segment nearly as wide as, but only about half as long as the second, with a faint median longitudinal impression, otherwise uniformly smooth, a broad yellow border along the posterior margin, continued laterally anteriorly and then toward the middle line, the posterior border with a brown line on each side; the second dorsal segment with the apical margin reflexed in much the same way as in *rectangulis*, its ornamentation almost the same in scheme and color as that on the first; the exposed portions of the remaining dorsal segments, the second, third, fourth and fifth ventral segments with an apical sinuate border, and the base of the apical ventral segment yellow.

♂.—10 mm.—Very like the ♀, from which it differs in having the clypeus entirely yellow, in the absence of yellow marks on the metathorax, in having yellow marks on the anterior coxæ, in the absence of accessory yellow lines to the border of the second dorsal abdominal segment, in the apical ventral segment of the abdomen which is not yellow at base, and in the tibiæ and tarsi which are more brownish than yellow.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Paratopotypes ♀, 1 or 2 mm., smaller than the type ♂, with practically all the anterior half and part of the posterior half of the clypeus black and with the second dorsal abdominal segment ornamented in the same way as the type ♂; ♂ metathorax with yellow marks.

All collected by F. H. Snow.

***Odynerus spectabiliformis* n. sp.**

Very like *spectabilis* in structure. The following description is comparative with reference to Saussure's description in his "American Wasps."

♀.—12 mm.—*Head*.—Clypeus broader than long and pitted with deep distinct well-separated punctures; vertex with a depression back of the middle ocellus; pubescence silvery and golden, but so inconspicuous as to escape superficial observation; black, with the following yellow parts: clypeus, scape anteriorly, a mark between insertion of antennæ, and somewhat above the same another mark between the antennal sockets and the eye margin, and a line on the cheeks and vertex along the posterior eye margin; scape and greater part of flagel behind brown.

Thorax.—Essentially as in *spectabilis*; pubescence the same as on the head and abdomen; mostly black; following parts yellow unless otherwise stated, anterior and posterior margin of pronotum, a spot on each side of scutel, postscutel (tinted with orange), mark on each side of metathorax rather ferruginous, spot beneath tegulae on pleura sort of orange color as is the nontestaceous portion of the tegulae and greater part of femora; the following parts are brown: coxae of middle and posterior legs partly, practically all of tibiae and tarsi; wings infuscated and brownish.

Abdomen.—Smooth and shining, with distinct well-separated punctures, excepting along the apical margin of the second dorsal segment and on the exposed portions of the third, fourth and fifth dorsal segments where they are very coarse and close, giving them an appearance of rugosities, the apical dorsal segment sparsely, these punctures on a smooth surface, the second, third, fourth and fifth ventral segments uniformly punctured in much the same way as the dorsal segments are at base, the apical ventral segment granular, following portions yellow, a broad apical band on the first dorsal segment prolonged on each side into a yellow mark extending forward laterally, and all of the succeeding segments except at base.

♂.—10 mm.—Essentially like the ♀, differing somewhat in the yellow of the scutel which is reduced to two inconspicuous spots and in the postscutel where the yellow is reduced to two lines.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Arizona.

Collected by F. H. Snow.

***Odynerus hidalgiformis* n. sp.**

Related to *hidalgi*, from which it is readily separated by the more sparsely punctured less deeply canaliculated second abdominal segment. Has the thorax longer than wide showing its affinity to *Stenodynerus*.

♀.—12 mm.—In structure, pubescence and sculpture very like *spectabiliformis*, but there is no depression on the vertex, and the posterior surface of the metathorax is bisected by a shining line.

Head.—Black, with the following parts yellow, greater part of clypeus, the blackish portion thereof being confined to the anterior two-thirds, supraclypeal mark extending up to between the antennal sockets, the anterior half of the scape and a spot on each side of the head back of the eyes.

Thorax.—Black, with the succeeding parts yellow, anterior half of pronotum, spot on each side of the thorax beneath the tegulae, a margin on the tegulae, a band on postscutel, and a mark on each side of the posterior aspect of the metathorax along the lateral margin.

Abdomen.—Black, mostly ornamented with yellow as follows: the first dorsal segment in such a way as to give the black portion a somewhat hour-glass appearance, an apical band prolonged along the lateral margin and then directed inward toward the median line on the second dorsal segment, an apical band on

each of the succeeding dorsal segments, the apical segment is yellow, excepting the blackish margins, the 2nd-5th ventral segments are margined with yellow laterally and posteriorly, the apical ventral segment with a transverse band.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected by F. H. Snow.

Odynerus canaliculatus n. sp. (Pl. XII).

= *Odynerus iturbidi* Vier., Tr. Ks. Ac. Sci., xx; Tr. Am. Ent. Soc., xxxii.

Differs from *iturbidi* in the apical edge of the second dorsal segment being reflexed practically as in *rectangulis*.

♂.—11 mm.—*Head*.—Clypeus deeply emarginate, bidentate, yellow; hook of antennæ brown; rest of the head black, excepting the triangular yellow supra-clypeal mark, yellow to ferruginous mark in emargination of and back of eye and ferruginous pedicel; greater part of first flagellar joint ferruginous as is the posterior aspect of the scape, its anterior aspect being yellow; mandibles black at base and apex, mostly brown.

Thorax.—Metathorax with no dentiform angle on each side but rounded off; pronotum tinted with yellow anteriorly; scutelli only partly ferruginous; middle segment not at all ferruginous; legs to basal third of femora inclusive black, remainder mostly yellow, with part ferruginous.

Abdomen.—First dorsal segment practically impunctate, its venter and anterior face of dorsum black, as is a spear-shaped mark united with the black of the anterior aspect, the remainder of the segment ferruginous, with a yellow then testaceous apical border, the second dorsal segment on the basal half partly like the first and with an obtuse angled triangular black mark, which latter is bounded posteriorly and laterally by ferruginous then by yellow, the yellow extending to the apex of the segment; channel very coarsely punctured and spinose; second ventral segment not channeled, otherwise in color and pattern like the corresponding dorsal segment; the rest of the abdomen mostly yellow and punctured. Otherwise as in *iturbidi*, see Sauss., "Am. Wasps."

Type —University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) tempiferus n. sp. (Pl. XII).

Excepting the length of the thorax, this agrees in size and structure with Saussure's description of *iturbidi*, from which it is very different in color and color pattern.

Head.—Clypeus entirely yellow, a tribolate supra-clypeal yellow mark, a yellow mark, a yellow line along the eye margin extending from the clypeus to the apex of the emargination of the eyes, the cheeks with a yellow line along the eye margin, the scape in front and the mandibles almost entirely yellow, the

scape posteriorly, the pedicel and first to third joints of flagel more or less ferruginous to brown, hook partly brown; mouth parts various shades of brown; otherwise black, with golden pubescence.

Thorax.—Mostly black, with golden pubescence, excepting on the dorsulum where it is blackish; pronotum almost entirely brownish to ferruginous to yellowish; tegulae testaceous and yellow; the subtegular spot mostly yellow; an oblong mark on each side of the scutel and a transverse line on the postscutel, and the superior aspect of metathorax yellowish ferruginous; coxae in front mostly yellow, black behind, trochanters mostly black, anterior and middle femora yellow and ferruginous, posterior femora black at base, yellow at apex, ferruginous between, tibiae and tarsi mostly yellow; wings mostly fuscous, especially the marginal cell, the stigma, the costal and subcostal nervures from the stigma to base of wing, the costal cell, median and submedian cells more or less yellow.

Abdomen.—Mostly yellow, or yellowish anterior aspect of first dorsal segment, base of first and second ventral and second dorsal segments and an hourglass-like black mark on first and second dorsal segments black.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August by F. H. Snow.

***Odynerus (Stenodynerus) rectangulis* n. sp.**

Agrees with the description of *toltecus* in Saussure's Am. Wasps, excepting in the following particulars:

Head, thorax and abdomen black, maculated with yellow.

♀.—*Head*.—Clypens coarsely punctured, some of the punctures confluent, others nearly so; no ferruginous mark at base of antennae, anterior portion of scape yellow; a yellow band at the posterior margin of the clypeus.

Thorax.—With a yellow mark on each side of the mesonotum at the junction of the wings with the thorax; postscutel not at all carinate transversely; the metathorax broadly excavated, pitted and striated, coxae, trochanters and femora mostly black, the anterior and middle femora tipped with yellow, tibiae and tarsi brownish testaceous.

Abdomen.—The posterior margin of the first dorsal abdominal segment bordered by a yellow band which is prolonged obliquely forward to the anterior edge of the segment and nearly to its middle line; the second and third segments are conspicuously margined with yellow posteriorly, the fourth and fifth dorsal segments bordered with a yellowish line along the posterior margin.

♂.—7 mm.—*Head*.—No tubercle on the vertex; clypeus apparently wider than long.

Thorax.—Metathorax black; middle and posterior coxae yellow anteriorly, as are the middle femora.

Abdomen.—With spines in the channel of the second dorsal segment and a thorn-like projection on the first ventral segment; with the exception of the apical yellow band on the first and second dorsal and second ventral segments the abdomen is black.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) papagorum n. sp.

Related to *toltecus*, from the description of which, in Saussure's Am. Wasps, it differs as follows :

♀.—9 mm.—*Head*.—Clypeus rather coarsely punctured, with some of the punctures apparently confluent, its anterior margin nearly straight, brown, and not much wider than the scape is thick, its posterior margin bordered with yellow, a yellow border along the lateral margin on the lower half; a yellow mark immediately above the insertion of the antennæ and a yellow mark on that portion of the face which borders along the emargination of the eye, a yellow line on each side of the head directly back of the eyes; a rounded depression on the vertex posterior to the anterior ocellus, this depression being large enough to snugly hold the anterior ocellus; scape yellow anteriorly; mandibles brown at apex, with a yellow mark near the base.

Thorax.—The anterior margin of the pronotum bordered with yellow, which extends back to the posterior margin along the middle third of the latter, the posterior margin in addition is partly testaceous to brownish in color; the tegulæ are mostly testaceous, with a brownish cast, but in addition they have a yellow mark on the anterior and posterior portions; postscutel distinctly convex, but not crested, with an undulated yellow line or band; posterior face of metathorax with its lateral rounded elevation covered with an elongate yellow mark; wings transparent, suffused with a smoky tint, which is deepened to fuscous in the cells along the anterior edge of the wing, especially in the marginal cell; anterior and middle femora black, brown and luteous, the posterior femora black and brown, tibiæ mostly ferruginous to reddish-brown, the middle and posterior pairs being ornamented with a luteous stripe on the external aspect; tarsi brownish testaceous, claws brown.

Abdomen.—Posterior edge of the 1st dorsal segment with a yellow border, as is the same edge on each of the other segments, excepting the first ventral, and the apical segment both dorsal and ventral; in addition there is a yellow on each side of the second dorsal segment.

♂.—8 mm.—*Head*.—Clypeus uniformly yellow, finely punctured; supraclypeal mark extending down to the posterior margin of the clypeus.

Thorax.—The middle and posterior coxæ are yellow anteriorly; the middle femora are armed with a kind of tooth on the inferior aspect in the middle.

Otherwise as in the ♀.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One paratopotype has a brownish testaceous mark on the posterior half of the dorsulum, this mark is barely represented in the type by two minute spots; another paratopotype has the latter mark

yellowish; the anterior margin of the clypeus blackish, and the posterior and lateral yellow margins of the clypeus joined together leaving the black portion of the clypeus in outline like a conventional toadstool.

This species was captured by F. H. Snow in August, 1902, and in July.

Odynerus (Stenodynerus) cochisensis n. sp.

Differs from the description of *vagus* (Sauss., Amer. Wasps) in structure, color and sculpture as follows:

♀.—7 mm.—*Head*.—Hardly wider than high; black and yellow; on the vertex nearly halfway between the anterior ocellus and the posterior margin of the head there is a small flat shining space which gives the appearance of being a flattened tubercle; mandibles brownish at tips, black along the edge, greater portion of basal two-thirds yellow; clypeus mostly yellow, the anterior lateral margin edged with black, the anterior margin brownish; the yellow mark between the insertion of the antennæ ovoid in outline; scape with its basal half and the anterior aspect of the remaining half yellow, the portion of the head fitting into the emargination of the eye completely yellow; cheeks with a yellow mark along the eye margin at the top of the head.

Thorax.—Apparently no flat space on either side of the metanotum adjoining the postscutal; metathorax rounded, the rugulose excavation not margined but bisected by a rather indistinct raised line; anterior half of the pronotum yellow, tegulæ yellow, excepting a testaceous cuneate mark in the middle; mesothoracic episternum with a yellow mark beneath the tegulæ, this mark separated by a black line; directly back of the tegulæ there is a yellow cuneate process and an almost quadrate yellow spot on the posterior third of the dorsulum; postscutal yellow; a large yellow mark on each side of the metathorax; wings transparent, somewhat clouded, especially in the cells along the anterior margin; coxæ mostly yellow in front and black behind; trochanters black; anterior and middle femora almost completely yellow; posterior femora mostly black, tipped with yellow; tibiæ and tarsi mostly yellow, the latter more or less brownish near the apex and at the apex; claws brown.

Abdomen.—Black and yellow; first dorsal segment with a yellow apical band that is prolonged anteriorly for a short distance along the lateral margin and then obliquely inward toward the middle line, making an interrupted transverse band with its fellow; the pattern on the dorsum of the second segment pretty much the same as on the first segment, but the oblique bands come closer together, and the yellow apical band is confined chiefly to the channel which is bounded apically by a low flange which when viewed from the side makes an obtuse angle with the rest of the segment; second ventral segment yellow, with the exception of a quadrate black area occupying the middle two-fourths of the basal two-thirds of the segment and a brown line in each yellow lateral border; third, fourth and fifth dorsal ventral segments with an apical yellow band; the following dorsal segments mostly yellow, the follow ventral segments mostly black.

♂.—7 mm.—Very like the ♀ in structure, sculpture and color.

Head.—No flattened tubercle back of the anterior ocellus, the vertex being uniformly closely punctured or rugose; the clypeus about as wide as long, entirely yellow; the yellow mark between the antennal sockets prolonged down to the clypeus.

Thorax.—The yellow on the metathorax reduced to a spot on each side, and but one spot on each mesothoracic episternum.

Abdomen.—There is a spot instead of an oblique band on each side of the first dorsal segment.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Three ♀ and three ♂ paratopotypes, the males are all practically alike, while in the females there is some variation in the maculation, notably in the clypeus, where the yellow is more reduced or more elaborate than in the type and on the scutel where two yellow spots present themselves; furthermore, the yellow of the metathorax and on the mesothoracic episternum is decreased or increased in extent as compared with the type.

All the specimens were taken in August, 1902, by F. H. Snow.

***Odynerus (Stenodynerus) provisorius* n. sp. (Pl. XII).**

Superficially like *spectabiliformis*, from which it differs, especially as follows:

♂.—14 mm.—In size, in the postscutel and in the abdomen, this is more like *Odynerus* s. s. than *Stenodynerus*. In structure it seems to come nearest to the group of which *O. flavopictus* is representative.

Head.—As long as wide, dullish, punctate, the punctuation pretty much the same as in *campestris*, black, yellow and reddish-yellow; clypeus entirely yellow, its anterior edge arcuate and about two-thirds as great as the anterior lateral margin, a transverse supraclypeal yellow mark with its lower margin emarginate and on a plane or nearly on a plane with the posterior or upper edge of the antennal sockets, the lower edge of the eye emargination bordered with yellow, a vertical reddish-yellow stripe bordering the portion of the eye nearest the anterior ocellus, another reddish-yellow stripe bordering nearly the entire posterior margin of the eye; mandibles mostly yellow, margined with blackish and brownish; scape yellow in front, reddish-yellow behind, pedicel and first joint of flagel entirely reddish-yellow, the remainder of the flagel almost entirely black, excepting the fourth joint of the antennæ which is partly brown; pubescence inconspicuous, golden, tinged with brown, in no place much longer than the pedicel.

Thorax.—Sculpture much the same as *campestris*, but there is a longitudinal impressed line on the anterior half of the mesonotum and the scutel in the middle; pubescence as on the head; black and reddish-yellow, the latter color being confined to the greater portion of the pronotum, including the anterior and posterior margins, tegulae, a spot below the latter on the mesothorax and a spot on

each side of the scutellum and postscutellum; wings colored as in *tempiferus*; legs simple and more or less reddish-yellow, excepting the coxæ, trochanters and basal portion of the femora, claws castaneous.

Abdomen.—Very as in *tempiferus*, but the margins not wrinkled, simple, rather coarsely punctured; the black portion of the first and second dorsal segments not at all hourglass shaped, but more pyramidal; pubescence nearly as on the head.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Paratype ♂ differs from the type as follows: mesonotum with two curved reddish lines, tubercles brownish testaceous, second joint of the flagellum mostly reddish, hook of antennæ brown.

Collected in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) yumus n. sp. (Pl. XIII).

Has much the same form as *taos*, but the second dorsal segment of the abdomen is reflexed as in *rectangulis* or nearly so. Compared with *taos* it differs as follows:

Head.—Practically the same, but 12th and 13th joints of antennæ cylindrical and of about the same width or diameter.

Thorax.—Rather dullish; scutellum with a median longitudinal impressed line; postscutellum not at all produced but rather flattened; metanotum with a yellow spot on each side; femora simple, the anterior and middle pair partly black, mostly yellow, the posterior pair mostly black, yellow only at tip, tibiae also simple, almost entirely yellow, tarsi brownish testaceous.

Abdomen.—Practically as in *taos*, excepting as already described.

The yellow portions of this species, as represented by the type, are lemon yellow.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in July by F. H. Snow.

Odynerus (Maricopodynerus*) maricoporum n. sp.

Subgenerically related to the group represented by *toltecus*, from which it differs, especially in the peculiar abdomen. The points in which it differs from *toltecus*, see description "Syn. Amer. Wasps," Saussure, are as follows:

♂.—7 mm.—*Head*.—Clypeus apparently broader than long; black, clypeus entirely luteous, anterior aspect of scape luteous, with a brownish tint, above blackish, brown below, yellow markings of the face confined to that portion

* N. subg. Type *O. M. maricoporum* Vier.

which fills in the emargination of the eyes, part of the cheek and part of the vertex: vertex convex and uniformly closely punctured.

Thorax.—Rather cubical, the metathorax excavated, with the excavation shining and rather sparsely punctured with fine punctures; black, with pubescence nearly as on the head where it is about the same as in *papagorum*, anterior third of pronotum yellow, its posterior margin partly brownish testaceous, mesopleura with a large yellow spot that almost adjoins the tegulæ, which latter are brown, with a yellowish tinge on the anterior margin, a yellow spot on each side of the scutel, postscutel traversed transversely by a yellow line, metathorax mostly ferruginous, with practically only its dorsal aspect black; legs largely ferruginous; trochanters and coxæ partly blackish, as are the tibiæ and the bases of the femora, anterior femora with a yellow or luteous mark on the outer aspect; anterior, middle and posterior tibiæ yellow externally, tarsi fuscous at base, brownish at apex.

Abdomen.—Partly black, pubescent, like *papagorum*; first dorsal segment with a deep pit immediately anterior to its posterior margin; second dorsal segment nearly twice as long as wide at its base and forming a sort of canopy over all the succeeding segments; beyond the second segment seemingly smooth and impunctate; first segment mostly ferruginous, with the dorsal apical margin yellow, bordered with black anteriorly to the yellow; second dorsal segment margined with testaceous, with its black split up into five lobes by a luteous mark; second ventral segment mostly black, partly testaceous, with the entire posterior margin testaceous, beyond the second segment the exposed portions of the segments are testaceous.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August, 1902, by F. H. Snow.

***Pepsis angustimarginata* n. sp.**

Related to *atalanta*, *cerberus* and *basifusca*.

♀.—26 mm.—Almost entirely Prussian blue, with a sericeous sheen, excepting the antennæ and tarsi which are blackish. Wings reddish, brownish-yellow, the extreme base blackish, the apical half more of a yellowish than the basal half, the apex and the posterior margins of the posterior wings, and the greater part of the apical portion of the posterior margin of the anterior wings bordered with fuscous, the fuscous not extending half way into any of the cells it margins.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August by F. H. Snow.

Paratype ♀ 23 mm., from Salt Lake City, Utah, July 25, 1897.

***Gorytes subaustralis* n. sp.**

Closely related to *phaleratus*, of which it may prove to be a race.

Black, with exceptions as noted in the following description.

♀.—12 mm.—*Head*.—Eyes as in *decorus*, that is converging toward the clypeus, the distance between the eyes at the base of the clypeus being one-half or nearly one-half as great as the distance between the eyes along an imaginary straight line drawn from eye to eye and through the center of the posterior ocelli; front with fine, sparse punctures, some of which are as much as .5 mm. apart; clypeus nearly twice as broad as long, yellow, convex, indistinctly punctured, more sparsely so than the front and with a dimple near the center; that portion of the face which lies between the eyes, clypeus and insertion of the antennæ is yellow; antennæ thicker beyond the middle than before, scape easily twice as thick as the first joint of the flagel and as long as or nearly so as the first joint of the flagel and pedicel, yellow, flagel pale brown, its first joint a little longer than the second, pedicel concolorous with the flagel, mandibles black at tip, yellow at base and brown between.

Thorax.—Smooth, polished, dorsum appearing dullish, apparently on account of the presence of an indefinable pubescence, pronotum, tegulæ, posterior and anterior margins of the propleura, mesonotum with a yellow margin laterally, anterior and inferior aspects of the mesothorax separated from each other by an arcuate channel that originates approximately .5 mm. posterior to the posterior margin of the tegulæ and extends as one continuous channel, which almost attains the channel between the meso- and metapleura, the latter have a large mark which occupies nearly all of the anterior half of its lateral aspect; mesosternum with a median furrow along which there is an indistinct ridge, otherwise much the same as the dorsulum; a little more than the posterior half of the scutel, and the posterior two-thirds of the postscutel yellow; metathorax smooth and pubescent in much the same way as the mesothorax, a fork-like impression extending from the inferior portion of the posterior aspect of the metathorax to the middle of the postscutel, laterally the prongs of this fork extend from the center or near the center of the metathorax to a point on a line with the posterior interior point of the wing insertion, the diverging impressions forming the enclosure, which is bisected by the prolongation of the median impression, all the impressions slight, except the posterior half of the longitudinal one; tibiæ and tarsi spinose; wings strongly brownish-yellow, excepting the apical fourth which is mostly pale and more of a yellowish hyaline color than the marginal cell which in turn is fuscous, stigma brownish testaceous, nervures brownish, excepting those of the basal half of the wing which incline testaceous, a little more than the posterior two-thirds of the postscutel and of the posterior half of the scutel, an almost oval spot on each side of the metathorax taking up nearly all of its surface and leaving only a margin of black externally and internally and not encroaching upon the enclosure, yellow, legs mostly brownish-yellow, coxæ black, trochanters, basal and posterior portions of the posterior femora more or less dark brown; pulvilli brownish.

Abdomen.—Smooth and shining and pubescent in much the same way as the thorax, mostly yellow, lateral margins of the first ventral segment black, on the second ventral segment there is an almost tongue-shaped dark brown mark which extends from the base to a median circular apparently bronzy space near the apex, the succeeding ventral segments excepting the apical one are brownish to blackish at base, first dorsal segment with a median brownish line on the anterior half and a narrow almost blackish border posteriorly, the three succeeding dorsal segments have a blackish margin at base beyond which the second seg-

ment is castaneous, the apical dorsal segment is a practically triangular plate that is distinctly though not strongly margined, and approximately one and one-half times as long as wide at its base, its surface roughened, appearing closely, indistinctly, longitudinally striate, on each side of the plate the tegument is shining and somewhat more sparsely punctured than the front, this structure is practically duplicated on the corresponding ventral segment, the punctuation on the latter is, however, not nearly so distinct as on the former.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., 6000 ft. elevation, Arizona.

Collected by F. H. Snow.

Gorytes papagorum n. sp.

Closely related to *phaleratus*, of which it may be a race. Ground color black.

♀.—11 mm.—*Head*.—Front smooth and shining, with a few small punctures, clypeus with more numerous punctures than the front, but less distinct; scape as long or nearly as the pedicel together with the first joint of the flagel, the latter distinctly longer than the next, but not as long as the second, plus half of the third, pedicel and flagel mostly brown; greater part of the basal half of the mandibles, clypeus and face below antennæ, a prolongation along the inner eye margin and the greater part of the scape yellow.

Thorax.—Rather dullish, though somewhat shining above; mesosternum anteriorly distinctly carinated, the upper third of the mesopleura not separated from the lower two-thirds, suture between the scutel and mesonotum not foveolate; wings strongly brownish in the marginal cells, elsewhere more of a yellowish-brown, transparent, nervures brownish, stigma yellowish; pronotum, tubercles, a margin along the mesonotum where it joins the tegulæ, a mark on each mesopleuron, posterior half of scutel, posterior two-thirds of the postscutel and a mark on each side of the metathorax, yellow; anterior and middle tibiæ in front and all tarsi yellow; tibiæ and claws mostly brown; tegulæ brownish testaceous.

Abdomen.—Greater part of first and of the succeeding segments yellow.

♂.—Essentially like the female.

Types.—University of Kansas.

Type locality.—Oak Creek Canon, 6000 ft., elevation, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Six specimens collected by F. H. Snow.

Three ♀ paratopotypes differ from the type, apparently only in color; in two of these specimens the second dorsal abdominal segment is quite brown, the one having nearly all of the basal two-thirds and the other the basal half brown; in the third ♀ specimen the metanotum has a yellow spot on each side; the ♂ paratopotype has its antennæ tipped with black.

Crabro cinctibellus n. sp.

Predominating color black; pubescence golden and mostly inconspicuous.

♀.—10 mm.—*Head*.—Very as in *bellus*, its scrobe which is nearly as long as the first joint of the flagel and nearly four times as long as wide, lies parallel to the inner eye margin, from which it is separated by a space about equal in width to the shortest diameter of the scrobe itself, the posterior edge of the scrobe is practically tangent to an imaginary line drawn across the vertex immediately anterior to the posterior ocelli; front, clypeus and malar space with conspicuous pubescence; scape and pedicel almost entirely yellow.

Thorax.—Propodeum nearly as in *interruptus*, its dorsal aspect separated from the posterior aspect by an impressed line rather than a series of foveæ; tibiae and metatarsi almost entirely yellow, pronotum yellow, excepting a medial quadrate black space, which separates the yellow into two parts, two oval yellow spots on the scutel, tubercles and tips of femora yellow; tarsi mostly brownish, as are the claws; wings transparent and brownish, stigma and nervures of anterior margin and basal half of the wing brownish testaceous, remainder of nervures brown.

Abdomen.—With a transverse band on each of the dorsal segments, except the apical one, yellow; excepting the band on the penultimate segments, the bands of yellow are narrower in the middle than laterally; the dorsal segments have the greater part of the apical fourth depressed below the level of the remainder of the segment, this depressed portion as well as the basal third of the segments are not yellow, pubescence quite conspicuous on the apical segment.

♂.—8.5 mm.—Sufficiently like the opposite sex, to be recognizable by comparison with the description of the latter, the posterior aspect of the metathorax is more rugose than in the female and not separated from the dorsal aspect by an impressed line or a series of foveæ; each of the dorsal abdominal segments has a yellow band analagous to that of each of the segments 1-5 in the female, but with the band on the first, second, third and seventh segments interrupted by a narrow brown line.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One ♀ paratopotype is somewhat larger than the type. Two male paratopotypes seemingly differ from the type only in having all the yellow abdominal bands except the apical one entire.

Taken in August, 1902, by F. H. Snow.

Crabro papagorum n. sp.

Related to *nigrifrons*. Black, with yellow markings.

♀.—10 mm.—*Head*.—Presumably very much the same as in *nigrifrons*.

Thorax.—Pronotum and tubercles very likely as in *nigrifrons*, or nearly so; dorsulum and scutel so closely punctured as to appear granular although manifestly punctate in certain parts, mesopleura as in *nigrifrons*; metathorax above as in *nigrifrons*, with exception of the longitudinal furrow, which is not much

longer than twice its width at the base, its posterior face appearing sculptureless with rather distinct margins laterally toward the apex; metapleura delicately striated; mesothorax and metathorax black, excepting the appendages, which are as follows: tegulae mostly testaceous, margined with yellow; wings transparent, tinted with brownish testaceous, stigma and nervures mostly brownish testaceous; middle and posterior femora and their metatarsi yellow, excepting a short brown line on the inner aspect of the middle tibiae, and a brown edge on the apical margins of the middle and posterior tibiae, middle and posterior femora tipped with yellow, posterior femora also tipped with brown, excepting the apical tarsal joint, which is brown and practically concolorous with the claws, the tarsi are yellow or yellowish.

Abdomen.—Quite smooth, with none of the segments noticeably depressed, with a yellow spot on each side of the first dorsal segment; second, third and fourth dorsal segments with a transverse, medially constricted, yellow line on the basal half; greater portion of the fifth dorsal segment yellow; a yellow spot on each side of the sixth dorsal and corresponding ventral segment.

Pubescence.—Rather long, thin and silvery, except on the apical abdominal segment, where it is somewhat yellowish.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 6000 ft., Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August by F. H. Snow. One female with head and prothorax missing.

***Crabro canonicola* n. sp.**

Related to *Maculipennis*, from which it differs in the characters here described; mostly black, with yellow markings; pubescence inconspicuous, with a golden tint; abdomen, especially the second segment, distinctly punctured, its dorsal segments, excepting the apical one, banded with yellow.

♀.—10 mm.—*Head*.—Very as in *confertus*, its scrobe forming an almost acute angled triangle, with the base nearly half as great as the altitude, and tangent to an imaginary straight line, which latter is in turn tangent to the anterior margin of the posterior ocelli, outer side of scrobe almost adjoining and parallel to the inner eye margin; the following parts are yellow; scape, part of pedicel, greater part of clypeus and mandibles, except their brownish tips.

Thorax.—Pronotum quite as in *ventralis*, dorsulum more closely punctured than the vertex and duller, scutellum polished with its punctures more separated than those on the dorsulum, episternal suture of mesopleura not conspicuously foveolate, base of metanotal enclosure nearly as in *maculipennis*, its central furrow nearly quadrate, shining and rugulose, the ovoid polished spaces of the metanotum surrounded by a foveolate furrow, the posterior aspect of the metathorax uniformly smooth and shining, separated from the metapleura by a slender ridge, the following parts are yellow: tibiae almost completely, except for the brown tips, pronotum, tubercles, episternum mesopleuralis, anterior and posterior edges of the tegulae, greater portion of the scutellum, a spot on each side of thorax directly

anterior to the scutel, greater portion of the oval spaces on metanotum, trochanters mostly, anterior and middle femora in part, posterior femora at apex, and the greatest portion of the basal tarsal joints; wings very as in *maculipennis*.

Abdomen.—Greater portion of venter yellow; first, second, third and fourth dorsal segments blackish at base and apex; dorsal apical segment yellow on each side, the corresponding ventral segment with a yellow spot on each side.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One paratopotype. Both the latter and the type were taken in August by F. H. Snow.

Curolinian Species.

Phenodus caddous n. sp.

Mesonotal furrows not sharply defined on the anterior half of the sclerite and represented on the posterior half thereof by low rounded raised lines that converge and separately meet or nearly meet the posterior border mesonotum.

♀.—3 mm.—*Head*.—Smooth, more or less polished and shining and seemingly without sculpture of any kind, different shades of castaneous; the mandibles yellowish testaceous; eyes black; antennae with the first eighteen joints brown-testaceous to brown in color, the next joint yellowish-brown, the next five joints or the remainder of the antennal joints brown, the scape nearly twice the length of the pedicellum; the combined lengths of the scape and pedicellum not much longer than the first joint of the flagellum, joints of the flagellum subequal.

Thorax.—In color about the same as the head, with the exception of the dorsulum, each side of which is partly blackish; dorsulum finely sculptured in part and shining, on the anterior half of this sclerite the space between the parapsidal grooves or where they ought to be is rugose, as seem to be the parapsidal grooves themselves, posteriorly the middle portion of the same region is granular; mesopleura with an irregularly shaped, impressed, smooth, partly polished, partly granular area occupying the greater part of the lower half of this sclerite, and a small portion of the upper half, and surrounded by rugose grooves and a rugose area, the latter occupying the greater portion of the upper half of the mesopleura; metathorax with its sides rugose, the superior and posterior aspects of the metathorax areolated, the posterior aspect in addition transversely reticulated, the areolation consisting of six areas formed by an almost equilateral triangle enclosed by raised lines and with its base occupying the middle third of the junction between the dorsal and posterior aspects of the propodeum, by prolongations of the raised line forming the base of the triangle and extending to the lateral margin of the metanotum and finally by nearly parallel raised lines extending from the base of the triangle to the apex of the segment and marking off the middle fifth or practically the middle fifth of the posterior aspect of the metathorax, the spines of the metathorax springing from a point near or at the middle of the junction of the sides of the metathorax, with the upper and poste-

rior aspects thereof; these spines are each rather blunt and about as thick and long as the last two joints of the antennæ and directed backward, a little downward and a little backward; wings somewhat clouded with brownish but transparent; nervures brownish, stigma yellowish testaceous, with a brownish tint, the second abscissa of the cubitus approximately as long as the first abscissa of the radius which in turn is about two-thirds as long as the radial side of the stigma; legs apparently simple and yellowish testaceous.

Abdomen.—Smooth and polished, castaneous to blackish, the second dorsal segment greater in extent than the rest of the exposed portion of dorsum of abdomen put together, about as wide on each side as at apex, which last is approximately one and one-half times as wide as at base; the first dorsal segment with a median longitudinal parallel sided, elevated, longitudinally striated space which is as wide as the segment at its base and separated from a smooth polished triangular space on each side by rather salient edges; ovipositor springing from the apex of the abdomen of equal length or nearly, the portion prolonged beyond the tip of the abdomen, a little shorter than the metatarsus of the posterior legs.

Types.—University of Kansas.

Type locality.—Lawrence, Kansas.

One specimen taken in June at twilight by E. S. Tucker.

Hedysomus wichitus n. sp.

Submedian cell of anterior wings a little longer than the median on the externo-medial nervure; front excavated and polished between the insertion of the antennæ and the ocelli; second joint of the antennæ about one third as long as the third; first transverse cubitus represented by a stump of a nervure not as long as the first abscissa of the radius and which if completed would presumably be interstitial with the recurrent nervure.

♂.—3.5 mm.—*Head*.—Antennæ seemingly as long as the head, thorax and abdomen combined, apparently 23-jointed, the joints soldered together, so as to preclude their positive differentiation, even with the aid of a lens magnifying twenty diameters; head apparently uniformly sculptureless and polished.

Thorax.—More or less granular, shining; parapsidal grooves distinct on the anterior half of the dorsulum, extending to the posterior margin of this sclerite, but not so distinct on the posterior half on account of the rugulose tegument between in this region, metanotum with a somewhat triangular area occupying nearly all its area, smoother and more shining than the adjoining parts and longitudinally bisected by a rather low, indistinct ridge, which is just about as conspicuous as the ridge, which imperfectly encloses the areas.

Abdomen.—Mostly granular and shining, partly smooth and polished; the first dorsal segment longitudinally rugulose, appearing somewhat longitudinally striate; the second dorsal segment not so coarsely sculptured as the first and divided into three parts by lateral longitudinal furrows that are not deeply impressed but still distinct, the lateral parts triangular and equal the central part nearly oblong and a little wider at base than at apex; the third and fourth dorsal segments much the same in sculpture as the succeeding ones, but with a faint shining, median, longitudinal raised line on the basal half.

Color.—Blackish and brownish; head brown; flagel mostly sort of a blackish testaceous; scape and legs practically entirely honey-testaceous; wings clear, with the stigma and nervures less brown to brownish testaceous.

Type.—University of Kansas.

Type locality.—Lawrence, Kansas.

One specimen taken at twilight in August.

Upper Sonoran Species.

Odynerus (Stenodynerus) congressus n. sp.

Differs from the description of *mystecus* (Sauss. Am. Wasps), as follows:

♀.—8 mm.—*Head*.—Clypeus not reticulate-rugose, but with coarse, mostly separated punctures, prolonged into two rather long teeth with a deep emargination between, its basal third luteous, like a line along the lower margin of the emargination of the eye and a somewhat Y-shaped mark above the insertion of the antennæ; a yellow spot behind each eye.

Thorax.—Edge of the pronotum not at all punctured, metathorax smooth or finely striate and punctured, not at all velutinous; anterior third of the pronotum yellow, tegule excepting a testaceous spot near their center and a concolorous margin, luteous, the following places also luteous: mark beneath the tubercles; postscutellum and a spot on each side of the metathorax yellow, femora mostly black, with a brownish stripe above and a yellow mark at apex, anterior tibiae striped with yellow, brown and black, middle and posterior tibiae mostly brown and yellow, all tarsi and claws more or less dark brown.

Abdomen.—First dorsal segment with a yellowish luteous border along its apical margin, the border being prolonged on each side, apical margin of the second dorsal segment rather luteous, the corresponding ventral segment of a similar color on each side, the pale color shading off into a narrow line of brown in the middle of the segment.

Type.—University of Kansas.

Type locality.—Congress Junction, Arizona.

Taken in July by F. H. Snow.

Lower Sonoran Species.

Odynerus pimorum n. sp.

Pubescence inconspicuous, silvery, mostly yellow.

♂.—11 mm.—*Head*.—Emargination of eye practically parallel sided and nearly twice as long as wide across the middle of its short diameter, clypeus occupying the greater part of the lower half of the face and nearly as wide as long, convex, smooth, apparently impunctate and covered by a short appressed pubescence, which in certain lights obscures the surface and gives it a silvery sheen, anterior margin regular and about as long as the lateral margin; vertex with a longitudinal rather indistinct impression extending from near the anterior ocellus posteriorly close to the posterior margin of the head; a black area

across the vertex from eye to eye and encircling the ocelli, this black arc extends backwards forming a border along the superior posterior portion of the head, flagel almost completely pale brown, its tip, which is somewhat recurved and apparently spatulate, dark brown.

Thorax.—Metathorax distinctly biconvex, shining and punctured in much the same way as the dorsulum, the excavation of the metathorax represented by a smooth line at the base of the groove between the two concavities, no lateral sharp ridges, the metathorax being rounded off laterally and devoid of processes at its junction with the abdomen; dorsulum with a broad median brown line extending from its anterior margin nearly to its posterior margin; on each side of the dorsulum there is a black mark extending from the junction of the anterior with the middle third, but not from the margin of the pronotum, back to the posterior margin of the dorsulum where it joins the black line along the suture between the dorsulum and scutel, the latter mostly yellow, with a longitudinal, bisecting, impressed line, most of the sutures of thorax brown or brownish; wings transparent, with a fuscous tinge; the apical cells and those along the anterior margin of the front wings clouded with fuscous; legs almost completely yellow.

Abdomen.—First segment nearly as long as wide at apex, smooth and finely, rather closely punctured; second segment a little wider at apex than long, punctured about like the preceding segment, succeeding segments more and more finely punctured, apical segment impunctate or practically without punctures; first segment with a brown mark basally on its dorsum and apically on its venter, second segment brown at its extreme base, with a greenish transverse line between the apical and middle thirds, the succeeding dorsal segments, except the ultimate and penultimate partly greenish, mostly yellow, penultimate segment black at base, mostly yellow beyond and partly greenish, apical segment black, with a brownish margin posteriorly, ventral segments yellow, with the following exceptions: third, fourth and fifth with a brown spot on each side at base, sixth black to brown at base, greenish along its apical margin, seventh blackish, with a trilobate yellow mark.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Collected in August by F. H. Snow.

***Odynerus pulverulenta* n. sp.**

Related to *saussurei*, from which it differs chiefly in the punctured first and second abdominal segments, and in the dull yellow livery. Black, with yellow to brownish-yellow markings.

♀.—10 mm.—*Head*.—Shining, closely punctured, except on the cheeks and vertex, where the punctures are more separated than on the front, an irregular depression on the vertex on a line with the median ocellus, clypeus smooth and shining, somewhat striate with the striae terminating in the sparse punctures; pubescent in such a way as to have the appearance of being dusted with a subtle yellowish powder; two spots on the anterior margin of the clypeus are yellow as are the following parts: a cuneate mark on each side of the posterior margin of the clypeus, an emarginate mark between the antennæ at their insertion, lateral

face mark along the eye margin between the clypeus and the beginning of the lower side of the emargination of the eye, and a stripe on the scape anteriorly.

Thorax.—With pubescence like on the head, mostly closely punctured in much the same way as the face, metathorax distinctly concave and bounded by a salient margin, which is produced into a rather acute angle near the middle of each side of the outermost edge of the basin of the metathorax, this basin striate and uniformly dullish, following parts yellow: anterior and posterior margins of pronotum, a spot on each side of scutellum, post scutellum and the lateral margins of the posterior face of the metathorax; wings brownish, with a yellowish cast, the marginal cell distinctly infuscated.

Abdomen.—Dullish and finely sculptured, except for the scattered indistinct pit-like punctures, apical margin of second, third, fourth and fifth dorsal segments very coarsely, deeply and closely punctured, ventral surface similarly sculptured to the dorsal surface, but with the pit-like punctures represented by distinct strong punctures, and the margin of the second, third, fourth and fifth segments much narrower and not so coarsely punctured, the following yellow: a band at apex of each of the dorsal segments, the second, third, fourth and fifth ventral segments and the sixth ventral mostly, the latter tinged with brown and partly brown the same as the corresponding dorsal segment, which latter is an exception to the statement made for the dorsal segments in that the brown color extends from base to apex along the middle portion.

Types.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Captured in August by F. H. Snow.

***Odynerus (Stenodynerus) anormiformis* n. sp.**

Similar to *anormis*, from which it can be separated at a glance by the predominating brownish ferruginous color. From the description of *anormis* (Sauss., *Am. Wasps*) it differs chiefly as follows: brownish ferruginous in color, excepting the eyes, ocelli, luteous ornaments and black of abdomen.

♀.—7 mm.—*Head*.—With luteous ornaments as follows: base of mandibles, basal half of clypeus, a somewhat V-shaped large mark on the front extending down to between the insertion of the antennæ and occupying that part of the face which fills the emargination of the eye and stripe adjoining the upper half of the posterior margin of the eye.

Thorax.—Luteous, as follows: greater part of the anterior half of pronotum, with the exception of a narrow interruption along the middle line, a spot on the dorsellum near the scutellum, tips of anterior and middle femora and a mark and stripe on each tibia; wings transparent, somewhat smoky, with the apex of the marginal cell infuscated.

Abdomen.—The edge of the second segment not conspicuously different in punctation from the remainder of the segment, greater part of second, third, fourth, fifth and sixth segment blackish, the following luteous: posterior third of first dorsal with its lateral prolongation extending to a little before the middle of the segment along the lateral margin, a circular spot on each side of the second

dorsal, an apical margin on the latter occupying nearly one-fourth of the exposed portion of the segment, a corresponding border on the second ventral and on fourth dorsal segments.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Collected in August by F. H. Snow.

Odynerus (Stenodynerus) gulielmi n. sp.

Related to *xanthianus*, from the description of which (Sauss., Am. Wasps) it differs as follows: black, with pale markings.

♀.—9 mm.—*Head*.—Basal third of clypeus yellow, as are the following parts: scape anteriorly (brownish basally), a mark between the insertion of the antennae and extending a little above the same, and another mark on the face above, filling the emargination of the eyes and a stripe back of each eye and adjoining the upper half of the posterior margin of the latter.

Thorax.—Postscutel elevated, almost crested along the anterior margin, uniformly, strongly punctured, the punctures about the same in size as those on the head and abdomen; the following parts luteous: anterior half of pronotum mostly tegulae, excepting a central testaceous area, a mark on dorsum back of tegulae and a stripe on the apical half of the anterior and middle femora; there is a luteous stripe on each of the tibiae; coxae and trochanters mostly black; femora and tibiae mostly brownish to brownish ferruginous, tarsi and claws completely brown; wings as to color about as in *anormiformis*.

Abdomen.—Second segment punctured much the same as in *anormiformis*; a triangular border along the posterior margin of the first dorsal segment with a lateral prolongation yellow, a spot on each side of the last named segment and its apical margin luteous, the following also luteous; apical margin of the second and third ventral and apical margin of fourth and fifth dorsal segments.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

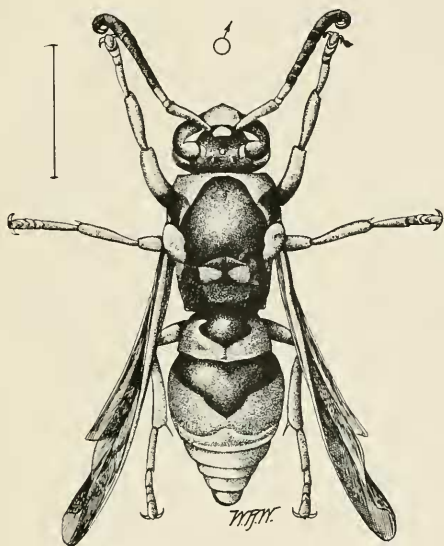
Collected in August by F. H. Snow.

Gorytes gulielmi n. sp.

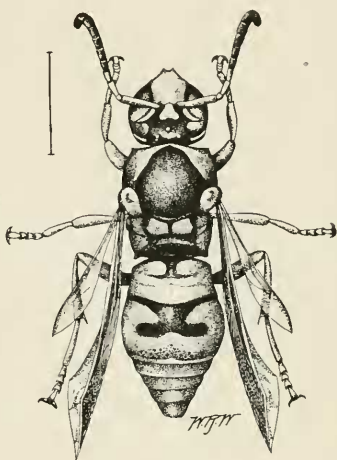
Related to *hamatus*. Black, with pale markings.

♀.—7 mm.—*Head*.—Front distinctly punctured, the punctures irregularly separated and nowhere adjoining; scape almost as long as the combined length of the three following joints of the antennae, first joint of flagel nearly as long as the two following joints together, the following parts yellow: clypeus, excepting the brown anterior margin, the mandibles at base, the scape in front, and a margin along the eyes on the face.

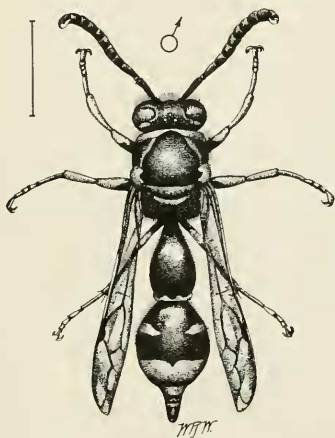
Thorax.—Dorsulum mesopleura and metathorax with rather large separated punctures, exclosure of the latter rather poorly defined and traversed by almost adjoining longitudinal striae, mesopleura distinctly carinated, but not at all distinctly separated into two areas each; tibiae and tarsi with rather sparse weak bristles, wings clear, excepting a fuscous cloud which occupies practically all of the marginal and first submarginal, fully half of the half of the second submarginal and a small portion of the third discoidal cells, there is also a fuscous spot,



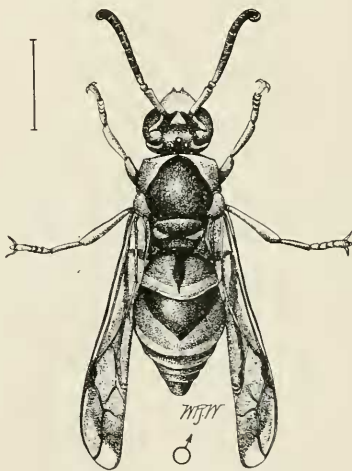
ODYNERUS PROVISOIREUS



ODYNERUS TEMPIFERUS



EUMENES ENIGMATUS



ODYNERUS CANALICULATUS